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TITLE

Methods of Synthesis of Polysuccinimide, Copolymers of Polysuccinimide and Derivatives thereof

This application is a Continuation-In-Part of Applications Ser. No. 10/307,349 and 10/307,387, both filed December 2, 2002, which are a Continuation and Continuation-In-Part, respectively, of Application Ser. No. 09/776,897, filed February 6, 2001, now US Patent No. 6,495,658, issued December 17, 2002, all three of which are incorporated herein by reference in their entirety.

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a process for the preparation of polysuccinimide, and derivatives; the polysuccinimide is formed in a supercritical fluid (SCF), such as liquid CO_2 or supercritical CO_2 in an organic cosolvent, starting with L-aspartic acid, and the derivatives are formed by a ring-opening reaction.

Discussion of the Related Art

L-Aspartic acid has been produced commercially since the 1980's via immobilized enzyme methods. The aspartic acid so produced mainly has been used as a component of the synthetic sweetener, N-aspartyl phenylalanine methyl ester (ASPARTAME®).

In a typical production pathway, a solution of ammonium maleate is converted to fumarate via action of an immobilized enzyme, maleate isomerase, by continuous flow over an immobilized enzyme bed. Next, the solution of ammonium fumarate is treated with ammonia also by continuous flow of the solution over a bed of the immobilized enzyme, aspartase. A relatively